

SECTION 520 -- BITUMINOUS PATCHING OF CONCRETE PAVEMENT

520.01 -- Description

This work shall consist of repairing certain joint and panel spalls in the concrete pavement with bituminous material. The work will be performed on the mainline roadways and interchange ramps at locations designated by the Engineer. This work shall include removing and disposing of deteriorated pavement and/or existing bituminous patching material, preparation of the repair areas, and furnishing, placing, and compacting the bituminous patch material in the repair area.

520.02 -- Material Requirements

1. The patching material shall be composed of a suitable aggregate, plant-mixed with a liquid asphalt blend. The bituminous material shall be capable of coating aggregates without stripping. The patching material shall be capable of maintaining adhesive qualities in patched areas which are damp or wet at time of application.

2. Bituminous Material - The bituminous material shall consist of a liquid asphalt blend with chemical additives capable of coating wet aggregates without stripping. The binder shall be homogeneous, free from water, and shall not foam when heated to mixing temperature. The bituminous material shall meet the following requirements:

Requirement	Criteria
ASTM D-1310	Flash Point (TOC): 200°F (94°C) Minimum
AASHTO T201 or ASTM D-2170	Kinematic Viscosity at 140°F (60°C): 300-4000
AASHTO T55 or ASTM D-95	Water: 0.2% Maximum
AASHTO T78 or ASTM D-402	Distillate Test (Volume of original sample): To 437°F (225°C): None
Residue Tests:	
AASHTO T202 or ASTM D-2171	Abs. Viscosity at 140°F (60°C): 125-425 Poises
AASHTO T49 or ASTM D-5	Penetration: 200 Minimum
AASHTO T51 or ASTM D-113	Ductility at 39°F (4°C) 1 cm/min: 100 Minimum
AASHTO T44 or ASTM D-2042	Solubility in Trichloroethylene: 99% Minimum

3. Aggregate - The aggregate shall consist of a crushed limestone complying with the following requirements:

English Sieve Size (Metric)	% Passing
3/8 inch (3.5 mm)	90-100
No. 4 (4.75 mm)	20-55
No. 8 (2.36 mm)	5-30
No. 16 (1.18 mm)	0-10
No. 50 (300 µm)	0-5

Requirement	Criteria
AASHTO T104 or ASTM C-88	Soundness Loss (Sodium-5 Cycles): 12.0% Max.
AASHTO T96 or ASTM C-131	Los Angeles Abrasion Loss: 40.0% Max.
AASHTO T-11 or ASTM C-117	-200 Sieve (75 µm) (By Wash): 2.0% Max.
AASHTO T-85 or ASTM C-127, 128	Absorption: 1.0%-2.5%
AASHTO T-85 or ASTM C-127, 128	Specific Gravity: Other Deleterious Matter: 2.55-2.75
NDR T504 or ASTM C-123	Soft Pieces 3.0% Max.
NDR T504 or ASTM C-295	Coal and Lignite 1.0% Max.
NDR T504 or ASTM C-142	Shale 2.5% Max.

4. Composition of Mixture - The mixture shall consist of the bituminous material and aggregate as described above, plant-mixed in such a manner as to contain 120 lbs. (54.4 kg) of bituminous material for each finished ton (.9 Mg).

5. Certification - The bituminous patching material will be accepted on the basis of a producer certification of the finished product.

520.03 -- Construction Methods

1. The Engineer shall designate the areas to be repaired. If the patch area is greater than 10 sq. ft. (0.9 m²), then the Engineer must approve either a bituminous repair or a portland cement concrete (PCC) repair. A PCC repair will be done as extra work if PCC repair is not a bid item. The deteriorated concrete shall be removed to a minimum depth of 4 inches (100 mm) or to sound concrete. The deteriorated concrete may be removed to a depth specified with a self-propelled milling machine or a 15 pound (6.8 kg) maximum chipping hammer. The operation of the machine must be closely monitored to insure that the impact and vibration of the milling head will not cause damage to the slab outside of the area designated for patching by the Engineer. The radii at the ends of each milled area must be cut to a reasonably neat vertical face with a 15 pound (6.8 kg) chipping hammer. For areas smaller than the milling head, removal must be accomplished with a 15 pound (6.8 kg) chipping hammer or other equipment approved by M & R.

2. After the deteriorated concrete and/or the existing bituminous patching material has been removed to the extent practical, the spalled areas at the joints or in the concrete slab shall be cleaned of loose concrete and remaining bituminous patching material using high pressure air until further application of

air fails to remove any significant quantity of material. Care shall be taken to avoid blowing any loose material into adjacent lanes which are open to traffic.

3. After the area has been blown clean and dry, the bituminous patching material shall be placed using hand methods to assure complete filling of the spalls. The spalled areas shall be slightly overfilled with bituminous material and compacted to a density that is satisfactory to the Engineer. A mechanically powered hand-held tamper shall be used for the smaller areas and a steel drum vibratory roller, minimum 2.5 ton (2.3 Megagram), shall be used on the other repair areas. The layer of the bituminous material shall not be in excess of that which the equipment is capable of compacting to a uniform density throughout the layer. If the patched areas have been depressed due to traffic, they shall be filled with bituminous patching material or an Engineer approved hot mix asphaltic concrete and compacted approximately ¼ inch (6 mm) above the existing pavement surface prior to the asphaltic concrete overlay.

4. Old concrete and/or bituminous patching material that is removed shall become the property of the Contractor and shall be removed from the project. The material shall be disposed of in accordance with Section 203 in the 1997 English Edition of the Standard Specifications.

5. The bituminous patching of the concrete pavement shall be accomplished at the same time the traffic lane is closed for concrete joint and panel repair.

6. The deteriorated concrete pavement and/or the existing bituminous patch material shall be removed and the patch completed during daylight hours in the same working day.

7. If asphaltic concrete for patching is not available when the pavement repair or joint repair work is performed, and the dropoff created by the repair is greater than one inch (25 mm), the dropoff will be feathered a minimum of three foot (900 mm) in length for each inch (25 mm) in height with a commercially available cold-mix bituminous mixture, or other suitable temporary patch material with a durable surface approved by the Engineer. The Contractor will be required to maintain normal traffic flow across these patches while they are in service. Where it has been necessary to use these "temporary patches", they will be removed, the area cleaned out, and the required permanent asphaltic concrete patch placed. The material, installation, maintenance, removal and disposal of these temporary patches will not be measured and paid for directly, but shall be considered subsidiary to the concrete pavement repair or concrete joint repair work being performed. The asphaltic concrete for the permanent patches shall be any available hot-mix bituminous mixture approved by the Engineer. The hot-mix material will be subsidiary to the items for which direct payment is provided.

520.04 -- Method of Measurement

- 1. a. The "Bituminous Patching" shall be measured for payment in tons (megagrams) on approved scales.
- b. The scale tickets shall be prepared in duplicate. The truck driver shall carry the original copy of the scale ticket to the delivery point and give it to the NDR placement inspector.
- c. (1) The measured quantity shall be the total weight of bituminous patching shown on the scale ticket without deduction for the asphalt binder in the mixture.
- (2) The Engineer shall deduct the weight of all material lost, wasted, damaged, rejected, or applied contrary to these Specifications.
- 2. The tonnage (mass) shall be the actual weight of the mixture including the liquid asphalt and the chemical additive.

520.05 -- Basis of Payment

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| 1. Pay Item | Pay Unit |
| Bituminous Patching | Ton (Tn)
[Megagram (Mg)] |
- 2. Portland cement concrete repairs of areas larger than 10 sq. ft. (0.9 m²) will be paid for as "Concrete Pavement Repair, Type ____". If "Concrete Pavement Repair" is not a bid item, then the PCC repairs will be extra work.
 - 3. Payment is full compensation for all work prescribed in this Section and all sealant manufacturer's requirements.

